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10/780,428	02/17/2004	Geoffrey David Bootle	DP-307793	2019

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DAVID P. WOOD
DELPH TECHNOLOGIES, INC.
Legal Staff, Mail Code: 480-410-202
P.O. Box 5052
Troy, MI 48007-5052

EXAMINER	
HAMO, PATRICK	
ART UNIT	PAPER NUMBER
3746	
MAIL DATE	DELIVERY MODE
05/12/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/780,428	BOOTLE, GEOFFREY DAVID	
	Examiner	Art Unit	
	PATRICK HAMO	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5 and 7-18* is/are pending in the application.

4a) Of the above claim(s) *4* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5 and 7-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on January 24, 2008 has been entered.

Response to Arguments

Applicant's arguments filed January 24, 2008 have been fully considered but they are not persuasive. The rejection below in regards to claims 1, 5 and 7-12 are substantially the same as in the prior action. In regards to the new limitations added to independent claims 1 and 10, it is the examiner's opinion that they fail to distinguish over the art of record, particularly the teachings of Buckley in combination with the other references. The rejections in regards to these newly added limitations are separately labeled for clarity.

Similarly, new claims 13-18 fail to patentably distinguish over the art of record. See the rejections below for explanations of the rejections.

Claim Objections

Claims 13 and 16 are objected to because of the following informalities: in claim 13, the word "contact" seems to be missing between the words "constant" and "with" in

line 3. The claim is interpreted as if the word "contact" were there for purposes of examination. Claim 16 fails to mention what rotates about said axis of rotation, but it seems based on the disclosure that the applicant meant for the cam ring to rotate. The claim is interpreted as such for the purposes of examination. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 5, 10, 13, 15, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sobek, 2,313,302 in view of Buckley, 5,613,839.

Sobek discloses a pump for pumping fluid with a first plunger 6 and a second plunger 5 each within a bore 2, 3, respectively, within a housing wherein the plungers with the bore define a pumping volume (see figs. 2-5), an inlet port 20 and an outlet port 21, an end of the first plunger arranged to cover the inlet during discharge and an end of the second plunger arranged to cover the outlet during intake, and each covering their respective ports in an intermediate stage (p. 1, col. 2, ll. 38-50), and there inherently being moments when the inlet and outlet ports are only partially covered.

Sobek does not disclose the respective plunger bores being in communication with one another by way of a connecting passage, two or more pairs of plungers,

wherein each pair is aligned along a respective common bore axis, the bore axes being oriented along a common bore axis plane, wherein the two or more pairs of plungers are driven by means of a single cam ring that is configured to rotate about an axis of rotation oriented substantially transverse to said common bore axis plane.

However, Buckley teaches a variable rate pump with two pairs of plungers (one pair in the left-to-right direction and one in the top-to-bottom direction of fig. 3), each pair aligned along a common bore axis, and the two axes being in a substantially planar field (that of the cross-section of fig. 3), and a single cam ring 32 driving the plungers with an axis of rotation transverse to the bore axis plane as defined by the planar field of the cross-section of fig. 3, and a communication path 40 (see fig. 1) connecting the respective plunger bores 16 of the first and second plungers of a given plunger pair. The invention of Buckley allows the pump to vary the pumping rate for a particular speed of rotation in order to meet emissions regulations (col. 1, ll. 41-43).

In regards to the newly added limitations to claims 1 and 10:

Buckley teaches that the pair of plungers 20 aligned in bores 16 (see fig. 1) are mounted in opposed in-line formation, as are the pair of plungers 20 mounted in bore 20 (see fig. 2). Each of these pairs of plungers are coupled to shoes 24 that embrace rollers 26 that are in contact with, and thus driven by, cam ring 32.

In regards to claims 13 and 15:

Buckley teaches that, during use of the pump, the pressure of the fuel entering the bores through the inlets pushes the plungers outwardly (col. 1, ll. 28-32).

In regards to claim 17:

Buckley teaches inlet port 36 diametrically opposed to outlet port 46 (see fig. 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the pump of Sobek with the cam actuation and multiple plunger pairs of Buckley in order to better vary the pumping rate.

In regards to claim 18:

It would have constituted an obvious duplication parts to one of ordinary skill in the art to have appended one or more pumps to the outlet of a first pump in series. There would have been no unexpected result as a consequence of such action, as the series of pumps would further pressurize the fluid being pumped. See MPEP 2144.04(6)(b).

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Babitzka, 4,709,673.

The references as applied to claim 1 above teach all the limitations substantially as claimed except for the following taught by Babitzka: two pairs of plungers 7, 9 aligned along two common axes 6, 8, driven by a single cam ring 31, the two pairs of plungers offset by 135° in order to optimize the supply rate of the individual partial injections of the two sets of plungers (col. 1, ll. 26-29).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the references as applied to claim 1 above with Babitzka in order to optimize the supply rate of injection (col. 1, ll. 26-29).

Furthermore, in regards to the claim limitations regarding pumping cycle phases of 115° to 130°, 120°, and 130°, the optimal figure for the phase difference is a matter of routine experimentation and therefore the difference between these values and that of the prior art fails to patentably support the claimed limitations in view of MPEP §2144.05(2)(a).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Cooke, 5,884,608.

The references as applied to claim 1 above teach the invention substantially as claimed except for the following taught by Cooke: a transfer pump (col. 5, ll. 49-50) for supplying fuel to a fuel inlet 48 of a fuel pump. Thus it would have been obvious to one having ordinary skill in the art at the time of the invention to supply fuel to the fuel pump of the references as applied to claim 1 using a transfer pump as taught by Cooke since the operation of the transfer pump is not dependent on the operation of the fuel pump, and the transfer pump in combination would achieve the predictable result of transferring fuel to the fuel pump.

Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Jay, 6,240,901.

The references as applied to claim 1 above teach the invention substantially as claimed except for the following taught by Jay: a common rail fuel pressurization system (col. 1, ll. 26-27) that uses higher pressure pumps and separates the process of

pressure generation and fuel injection to make the fuel pumping process less expensive and inject more uniformly (col. 1, ll. 13-37).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Sobek with Jay in order to make the fuel pumping process less expensive and inject more uniformly (col. 1, ll. 13-37). It would have been obvious to one of ordinary skill in the art that this modification would include connecting an outlet of the pump of Sobek in view of Buckley with the common rail fuel delivery system of Jay.

Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Fehlmann et al., 6,041,760.

The refereces as applied to claim 1 teach all of the limitations substantially as claimed except for the following taught by Fehlmann: a radial piston pump with pistons reciprocating against a cam ring whereby the pistons are biased against the cam ring by use of a restoring spring (abstract, ll. 2-7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have substituted the resilient spring of Fehlmann for the pressurized biasing of the references as applied to claim 1 above to achieve the predictable result of ensuring proper operation of a cam-driven radial piston pump by biasing the pistons against the cam.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references as applied to claim 1 above in view of Pigeroulet et al., 3,267,861.

It would have been obvious to one of ordinary skill in the art that driving either the cam ring or the housing with the pistons of the references as applied to claim 1, particularly Buckley, would achieve substantially the same result. Just as much is taught by Pigeroulet, which teaches that "an annular cam... coaxially surrounding said body and adapted to cooperate with said pistons, said body and said cam being adapted to rotate with respect to each other" (claim 1, ll. 6-9). It would have been obvious to one of ordinary skill in the art to try one of a finite number of solutions (two solutions- one being to rotate the cam ring and the other to rotate the pistons within the cam ring) to achieve the predictable result of ensuring proper operation of cam-driven pistons by rotating either the cam ring or the pistons.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK HAMO whose telephone number is (571)272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3683

/Patrick Hamo/
Patent Examiner, AU 3746